

NAV23 - HEAT TREAT

NOTE - ALL QUESTIONS ON THIS AUDITOR'S PROCESS GUIDE IS CONSIDERED TO BE PRIORITY CODE "A"

1.	a. Identify types of heat treatment performed at your facility being audited:			
	___ Homogenize	___ Stress Relief	___ Normalize	
	___ Heat Soak	___ Anneal	___ Tempering/Quenching	
	___ Age Hardening			
	___ Other (Specify):			
	b. Is heat-treating performed to written procedures?			___ Yes ___ No ___ N/A
	c. Is it readily available to the operator?			___ Yes ___ No ___ N/A
2.	Are the heat treatment operations performed by a continuous process or individual furnace loads?			
	___ Continuous	___ Individual	___ Furnace Load	___ N/A
3.	If a continuous process is used, describe fully, using specific equipment identifications (e.g. model numbers):			___ N/A
	a. Identify heat source type:			
	b. Location:			
	c. Controls:			
	d. Placement of temperature monitoring equipment (i.e. thermocouples):			

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4.	If individual furnace loads are heat treated, describe:	___N/A
	a. Furnace type (e.g. car bottom, front load or side load). Include make or model number if possible:	
	b. Burner controls, including method of on/off switching:	
	c. Placement of temperature sensors (thermocouples): - In oven - On Product	
	d. Method of loading furnace/s:	
	e. Method of unloading furnace/s:	
	f. Method of cooling, including transport to cooling location:	
	g. Does the furnace have sufficient temperature sensing devices to insure uniform furnace temperature?	___Yes ___No ___N/A
6.	Does supplier's procedures address fuel source's requirements?	___Yes ___No ___N/A
7.	a. Do supplier's equipment contain mercury?	___Yes ___No ___N/A
	b. Is it identified?	___Yes ___No ___N/A
	c. Are necessary controls in place to prevent contamination of the part?	___Yes ___No ___N/A
8.	Do the procedures contain parameters, which meet applicable specifications (e.g. MIL-H-6875, MIL-STD-1684) for time and temperature?	___Yes ___No ___N/A
9.	Is a traveler or equivalent work process control document utilized?	___Yes ___No ___N/A

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10.	Does the work process control document contain requirements for time, temperature, cooling methods and documentation requirements?	___ Yes ___ No ___ N/A
11.	a. Are time at temperature charts produced? If not, describe alternative control/s used:	___ Yes ___ No ___ N/A
	b. Are the at-temperature charts traceable to the material?	___ Yes ___ No ___ N/A
12.	a. What is the method utilized to confirm successful heat treat to specific required mechanical properties (hardness, tensile testing, etc.).	___ N/A
	b. Does this method meet the specified requirement?	___ Yes ___ No
	c. Does the procedure ensure test coupons are heat treated together with the material?	___ Yes ___ No ___ N/A
13.	Does the procedure document the process for resolving nonconformance on heat-treated material?	___ Yes ___ No ___ N/A
14.	Does the supplier have a system for calibration of the temperature control equipment? (E.g. controller, thermocouple, lead wire):	___ Yes ___ No ___ N/A
15.	Are heat treating equipment and test equipment (including hardness testing) identified in a manner to reflect (ISO 4.11.1)?	
	a. Personnel responsible for performing calibration inspection?	___ Yes ___ No ___ N/A
	b. Personnel responsible for calibration/inspection.	___ Yes ___ No ___ N/A
	c. Item identity or serial number.	___ Yes ___ No ___ N/A
	d. Is calibration current?	___ Yes ___ No ___ N/A
	f. If calibration is subcontracted, are sufficient subcontractor controls in place?	___ Yes ___ No ___ N/A
<u>HEAT TREAT OVEN SURVEY (MIL-STD-1684)</u>		___ Yes ___ No ___ N/A
16.	Does the supplier have a system for heat treat oven/furnace survey?	___ Yes ___ No ___ N/A
17.	Has the survey been performed at the correct time interval?	___ Yes ___ No ___ N/A

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18.	Has it been done at the correct temperature?	___ Yes ___ No ___ N/A
<u>WITNESS HEAT TREAT WORK IN PROCESS AND RESPOND TO THE FOLLOWING:</u>		___ Not Observed ___ Sat ___ Unsat ___ N/A
	Record number of samples reviewed: _____	
19.	Is/Are the furnaces and controllers calibrated?	___ Sat ___ Unsat ___ N/A
20.	Is the temperature correct?	___ Sat ___ Unsat ___ N/A
21.	Is the correct cooling method/medium being utilized?	___ Sat ___ Unsat ___ N/A
22.	Are personnel cognizant of parameters (time, temperature, cooling method) required by procedure/s and work instructions?	___ Sat ___ Unsat ___ N/A
23.	Are results being properly documented (furnace charts)?	___ Sat ___ Unsat ___ N/A
24.	Are heat treat procedures/work control documents readily available to operators?	___ Sat ___ Unsat ___ N/A
25.	Is traceability being maintained and is the material being heat-treated identified by heat number, batch number, serial number or equivalent to assure material control and prevent material mix up?	___ Sat ___ Unsat ___ N/A
26.	Are test coupons being heat-treated together with the material?	___ Sat ___ Unsat ___ N/A

Additional Comments/Concerns: